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Grumman Road Show. *The mock-up of Grumman's history making X-29 impressed a lot of folks on its whirlwind tour of the East Coast. Above, young boys and their mom sneak a peak of the X-29 cockpit during an open house at Grumman's Glen Arm (Md.) facility. Grummanites in Florida and Georgia also viewed the sleek mock-up. The X-29 wowed visitors at the Kennedy Space Center (below) and the Pentagon, too.*

Technical Services Bids For Shuttle Payload Ops

NASA contract worth over $50 million to winner

Grumman's Technical Services Division is bidding on the last of the three major operations programs developed by NASA to streamline the processing of Space Shuttle missions at the Kennedy Space Center, Florida.

The latest one is called the Payload Ground Operations Contract. It gives the winning contractor the responsiblity for all payload work, from the time a firm signs an agreement to put its payload on board a Shuttle to the offloading after the mission and return of the payload to the owner.

"Our experience in manned payload processing stretches back to the Lunar Module project," says Fred Haise, president of Technical Services. "This contract, more than any other at the Kennedy Space Center, is Grumman's cup of tea."

"It's worth about $50 to $60 million per year in the initial years," says Joe Klimek, the director of the Payload Contract Assessment Team for GTSD. "It will be a 15-year contract in three year increments."

Right now, Grumman and five other competitors – Boeing, General Electric, Hughes, MBB/Erno, and McDonnell Douglas (the incumbent lead contractor) – are in the assessment period. These six were chosen from among 20 companies that bid for a chance to enter this phase. On September 1 they were allowed to send teams to the Kennedy Space Center to study the payload processing flow.

The assessment period will carry though the three-month proposal cycle, which begins when the request for proposal is issued in February.

Klimek says that they expect the winning contractor to be announced in September 1986. The winner's three-month transition period begins on October 1, 1986.

With a win, Grumman Technical Services would add between 1,000 and 1,400 people to its current 800-member workforce at KSC now working on the Shuttle Processing Contract. Most of the new hires – about 40 percent of whom would be engineering personnel – will come from current contractors.

But, unlike the Shuttle Processing contract, Payload Ground Operations' scope will expand with time. "The winning contractor will also be responsible for sustaining engineering tasks and new design related to Kennedy's efforts for the Space Station," Klimek points out. That would mean not only handling complex payloads when NASA begins to put the Space Station in orbit, but also require the contractor to assist NASA in the development and contruction of new payload processing buildings, structures and ground support equipment.

That's in the future, and there is plenty of weight to be put on the winning contractor's shoulders at first. "The contractor must be able to assist potential payload customers from all over the world. And at any one time there would be as many as three or four shuttle loads being processed. This is equal to as much as 10 to 15 significant payloads being processed or prepared for flight simultaneously," Klimek says. ■

NASA Upgrades EADS Contract To $50 Million

Since NASA signed the Engineering Analysis and Display System (EADS) contract with Data Systems in April, the space agency has been one happy customer.

"Right from the beginning, Data Systems has consistently performed beyond NASA's expectations and ahead of schedule. Because of this, NASA keeps asking for more," says John Belmont, EADS program director.

NASA recently upgraded the original $42 million contract to install and support the computerized engineering design system to approximately $50 million. The new funds are earmarked for additional equipment, personnel and special training.

EADS is a computerized engineering analysis and design system. It enables NASA engineers to perform simulations, modeling and engineering calculations at a rate considerably faster than they had been able to do with their old Univac system. EADS features two large-scale IBM mainframes and one smaller IBM that controls the system's output. The three computers channel work into a Cray X-MP supercomputer.

"The original proposal for EADS – and the system we've installed – was designed a few years ago," says Belmont. "But, in this business, the technology is always changing. NASA has asked GDS to help them keep up with it."

The Data Systems staff at NASA's Marshall Space Flight Center in Alabama has been increased from 10 to 16, including two computer maintenance people and a number of systems analysts and software programmers. The increase in staff was required to handle both software and hardware upgrades to EADS that NASA requested. NASA has also asked GDS for approximately $225,000 worth of additional user training for its people.

A team of GDS computer engineers and technicians in Bethpage on Long Island is also working to support EADS. The group is helping put together the expanded training package and is also working on software for the EADS image processing and graphics capabilities.

In addition to the latest contract upgrade, NASA has inquired about adding a fourth IBM mainframe and additional terminals for the agency's operators.

"The original contract calls for us to work with NASA and support EADS for 60 months," says Belmont. "At the rate the system and NASA's requirements for it are growing, I expect GDS will be here for a long time." ■

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Prowlers Arrive At Calverton To Get Their Claws Sharpened

The Marines have landed at Calverton. They recently dropped off the first of 50 EA-6B Improved Capability (ICAP) I Prowlers for update to the ICAP II configuration.

Grumman will also perform Standard Depot Level Maintenance (SDLM) services, which means taking out avionic equipment and stripping the aircraft of some structural components for update, overhaul and some structural repair.

The entire effort is worth about $200 million in business.

Update of the Navy and Marine Prowlers begins with early 1970's ICAP I versions. "Some are base capability Prowlers that had previously been updated to ICAP I configuration," says program manager Marty O'Connell. "We're going to put them through the process again."

The Prowlers are designed to jam enemy radar and communications. The ICAP II version is the first Prowler to use the Navy's standard AYK-14 computer. With its new software, it gives the crew additional information on their display screens, such as a map to help select targets. It carries new "universal" exciters that can be mounted under its wings or fuselage. Each exciter can jam two different frequencies at the same time.

It takes about nine months for a Prowler to go through the update and SDLM process. The first aircraft will be ready around August of next year. One Prowler will enter the modification line every month. Grumman will deliver aircraft through 1990. ■

The Way It Was. *From R. Maj. Rich Dunn, Capt. Jody Garrett and Capt. Ross Levin take a last look at the Prowler they delivered to Calverton. This is the first of 50 ICAP I versions that Grumman will upgrade to ICAP II configuration.*

Tankful Of News From St. Augustine Division

Navy extends KA-6D program, picks up first rewinged A-6

Grumman St. Augustine will continue work on the KA-6D tanker aircraft under a follow-on contract that began October 1. This Grumman division has also delivered the first A-6 Intruder under an 11-aircraft rewing contract.

The Intruder effort will amount to over $6 million in business. Each aircraft will have many new components when it leaves the St. Augustine facility. "For all practical purposes you could say we are replacing 50 percent of the structure," says John Hughes, the program director.

The main change will be the center section combo, which is the section from behind the cockpit to a bulkhead in front of the bird cage, an area in front of the arresting hook. "We are replacing the fatigue-critical components that age with the aircraft," says Hughes. The Grummanites will also change the wing stubs and the outer wing panels.

The Navy is also taking the opportunity to upgrade the weapons release system on these 11 Intruders. "It's a universal system that allows the aircraft to carry any stores (weapons, missiles, etc.) now carried by the latest A-6s," says Hughes.

Though each aircraft was slated for six months on the shop floor, the schedule has been changed. "The first delivery was two-and-a-half months ahead of schedule," says Hughes. "The rest will be completed a month, month-and-a-half ahead of schedule."

It takes about nine or 10 months to modify and refurbish the KA-6D tankers. Each one will be modified to the latest configuration and undergo standard depot level maintenance - SDLM - and super SDLM, which includes some additional structural enhancements. The modification program includes complete rewiring.

About $1.5 million of work will be done on each of the dozen tankers covered in this contract. ■

Things Are Humming. *The Grumman St. Augustine Division recently delivered its first rewinged A-6 to the U.S. Navy. Grumman is rewinging 11 Intruders for approximately $6 million.*

Chuting Stars. *Senior parachute riggers George Stefanski and Bob Schumacher (R) do a continuity check on an brand new NB-7 chute, used aboard the E-2C Hawkeye. This is to ensure that all of the 28 parachute lines are connected properly. Parachutes for all Grumman aircraft are produced in Bethpage's Plant 4 by people from Flight Safety and Support. Stefanski, Schumacher, and master rigger Joe Crane turn out 50 new and reworked parachutes in an typical month. All of these are 28-foot, flat canopy chutes. The NB-7 chute is inserted in a fiberglass container that gets attached to the aircraft seat. This seat/safety package is ejected in the event of an emergency.*

Obituaries

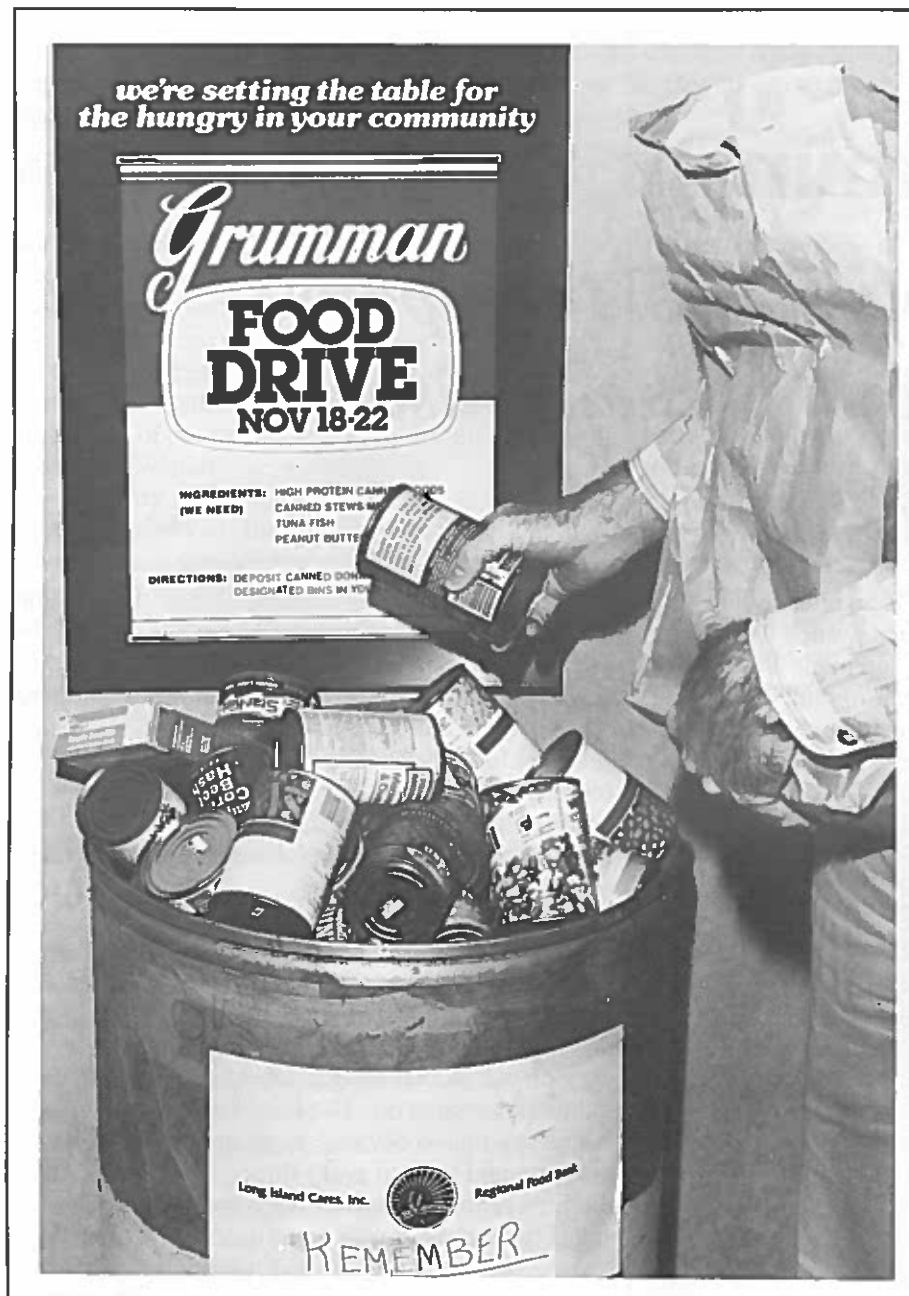
Joseph Maresca, C-2A Program Management, Plant 25, died October 18 at the age of 66. He had been with the company since 1950 and resided at 31 Oakwood St., Greenlawn, N.Y.

Thadeus Cybulski, Inspection Electrician, Plant 44, died October 20 at the age of 60. He had been with the company since 1965 and resided at 701 12th St., West Babylon, N.Y.

Harold A. Arnesen, Assembly Tooling & Handling Equipment, Plant 6, died Oct. 20, at the age of 58. He had been with the company since 1953 and resided at 7 Westwood La., Kings Park, N.Y.

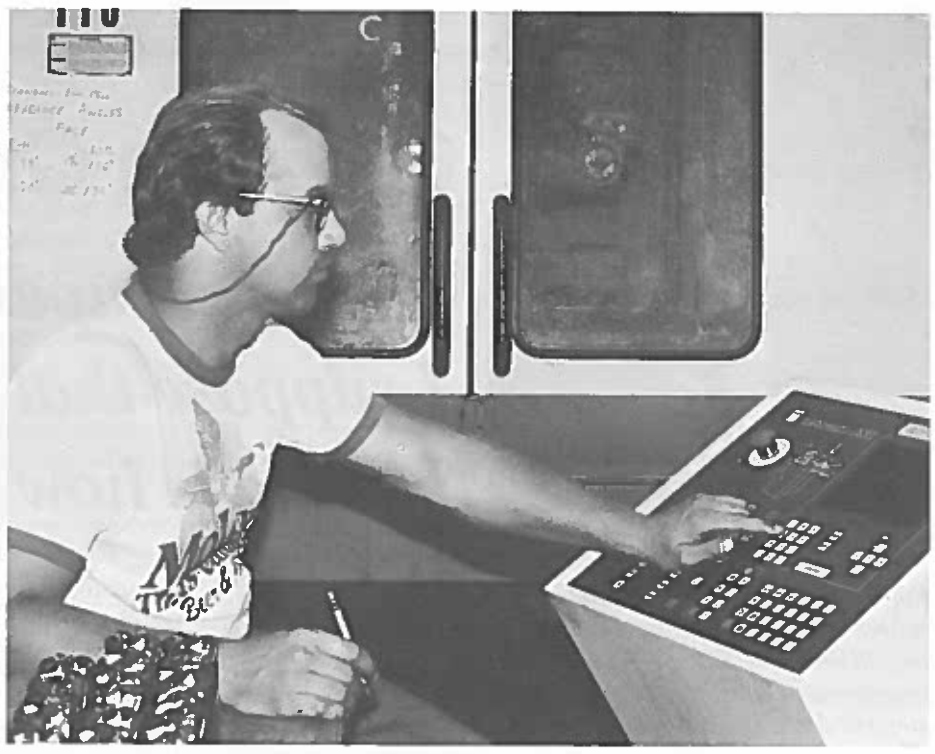
Ernest Maggi, Support, Plant 6, died October 12 at the age of 56. He had been with the company since 1965 and resided at 428 Atlantic Ave., Islip Terrace, N.Y.

Michael Smith, Services Division-Maintenance, in the William T. Schwendler Engineering Development Center, died November 2 at the age of 24. He and been with the company since 1983 and resided at 230 North 4th Street, Bethpage, N.Y.



Our Bins Runneth Over. *This week, Grummanites from Long Island to Houston opened their hearts and their cupboards to help feed the hungry in their communities. Grumman's first nationwide food drive ended today after a week-long effort to stock food banks in a number of Grumman locales with cans of high-protein food. The drive was part of a major Grumman effort to deal with the problem of hunger in this nation. How many pounds of food did Grummanites donate? The drive results will be published in the next issue of* Grumman World.

The Right Chemistry. *Ellen Ballman, a chemical engineer in Plant 12 - Materials Engineering, monitors an experiment involving aircraft paint primer. In the tests, a panel coated with the primer is placed in a sealed chamber. The constant humidity of this chamber accellerates the test results. The tests were to determine the corrosion resistance of a new paint primer. (Photo by Bob Settles)*



Programming Makes Perfect. *John Guethler programs the Walter Cutter-Grinder. The machine is the latest way to precisely sharpen milling and machining tools.*

Looking Sharp: Cutter/Grinder A Boon To Glen Arm Machine Shop

Automated System Combines Speed With High Quality

GLEN ARM, Maryland – It looks vaguely like a restaurant dishwasher or a triple-load washing machine. There's a plexiglass door on front through which you can see frothy water splashing about inside. But instead of dishes or socks, out of this machine come racks of what look like oversized drill bits.

The contraption is the computer numerical controlled Walter Tool Cutter-Grinder. The recent addition to Grumman's Glen Arm Machine Shop is the latest way to sharpen the cutting tools for the milling and machining equipment that abound at the Maryland facility.

Inside the Cutter-Grinder is an abrasive wheel that sharpens the tools to the final configuration. Since this generates heat, which can damage the tools, a coolant is used. The coolant is 98 percent water, while the other two percent is an additive made by Pillsbury that gives it its frothy look.

Previously, the various cutting surfaces of the tools were sharpened by manually passing them over an abrasive grinding wheel. While some tools are still treated in this fashion, most of the larger tools are refurbished in the Walter Cutter-Grinders. The new machines sharpen the tools to a precise geometry and symmetry.

The machine can complete a tool in one setup, whereas the conventional method can take as many as five or six setups. With the Walter, all of the different operations that go into sharpening a tool are automatic – programmed into a sequence.

Setup instructions for particular tools are on floppy disks. When a tool is first brought in for sharpening, John Guethler, the operator, must program software to tell the machine what to do. This task requires a lot of knowledge about tool-and-die making – and it helps to have a good understanding of math.

"You can't just hire someone off the street to operate the machine once everything is programmed in," says Guethler.

There's a trial-and-error step when each tool is first sharpened. "It takes about a half hour to get the setup exactly the way I want it," says Guethler. "After that it's perfect, and the same tool can be sharpened over and over again." ■

Personals

The loss of my son Peter at 18 in a car accident is immeasurable. How grateful I am for all your attempts to comfort. **Mary Westerling**

I would like to express my thanks to friends and co-workers for their concern and well wishes during my recent illness. **Chuck Cahn**

The many expressions of sympathy from my Grumman friends are most gratefully acknowledged. The thoughtful support was very helpful after the recent loss of my mother. **Robert Edgerly**

I would like to express my thanks and appreciation to all my friends for their thoughtfulness during my recent recuperation from surgery. **Sal Sakellarides**

My sincere thanks for the flowers received in Richmond, Virginia, for the funeral service for my brother Warren. **Doug Craven**

I wish to convey my thanks to all of my friends at Grumman for the cards during my recent temporary incapacitation. **Vince Holder**

I wish to thank all of my friends and co-workers for their kind expressions of sympathy during the recent loss of my mother. **Helen Pinnola**

I wish to thank all my friends, co-workers and ESO for all their get well wishes during my recent illness. **Bill Weaver**

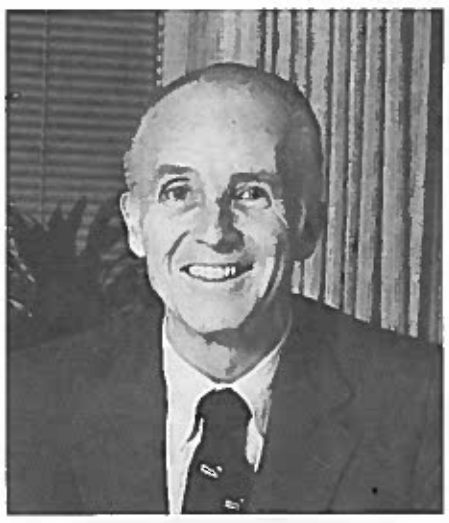
My father and family would like to convey our appreciation for the kindness and thoughtfulness expressed by ESO and my co-workers during the recent loss of my mother. **Ed Kropf and Family**

My family and I would like to thank all of my friends and co-workers at Grumman for their kindness and support during the recent loss of my father. **Mike Lucrezia and Family**

My family and I wish to express our appreciation to all my friends and co-workers for their kind expressions of sympathy during the recent loss of my father. **Victor Scalone**

My family and I wish to express our sincere thanks and appreciation to my friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my father. **Ed Bugeja**

We wish to thank all my friends in Plant 7 and ESO for their kind expressions of sympathy during the recent loss of my father. **Alfred J. Weber and Family**



Gavin on Grumman:

'This is a superbly capable company. I suppose that sounds chauvinistic — but that's how I see it.'

Former Grumman President Joe Gavin recently retired from the company after a 39-year career; he will continue to serve Grumman as a senior management consultant. In February, Gavin stepped down as president to become chairman of Grumman's Executive Committee, overseeing the reorganization of the company.

He spoke with Grumman World *about his years at Grumman, and the future he sees for the company. These are the highlights of that conversation.*

Grumman World: *You've been an engineer for over 40 years. What do you think of the young engineers you see today at Grumman?*
Joe Gavin: I'm impressed. I think they are better prepared, better educated, more sophisticated. The engineering process is more detailed today. Things are done less by approximation; there's more highly refined analysis. Grumman has always had the ability to put together a superior team that gets the job done. When I came here, the company was much smaller. Engineering was all on the second floor of Plant 5; the lines of communication were considerably shorter. Today, when it takes so long to go from concept to finished product, you forget the fast pace of the '40s.

GW: *Why did that change?*
Gavin: Primarily, because the products have changed so much – specifically, the proportion of electronics involved. There's no question that the refinement in design brought about by demands for performance has changed the nature of the job. It takes longer, requires more people – and the consequences of mistakes are more dramatic.

There's always been a basic problem when you're dealing with a new product: you can't do everything perfectly. With a new aircraft, a certain number of things are going to have to be reworked, redone. But in the early days, you could handle those problems quicker and with less attention from the customer and the press. Some of the things we did in the early '50s wouldn't be tolerated today, I suppose. Once, we had 12 or 13 early production planes sitting out in Peconic while we were still trying to optimize the geometry of the back end, where the exhaust comes out of the engine. We had a test aircraft out at Edwards, trying several variations. All this was taken in stride. We put the aircraft back together, and there weren't any headlines about it, either. It would be hard to imagine that today without congressional investigation, lots of attention from the press, and recommendations for cancelling the program.

Engineers have always been a conservative lot – and this atmosphere, which has existed since about 1968, has made them even more conservative. It's a climate that has failed to recognize that if you're going to accomplish something significant, there will be a certain amount of risk and things won't go perfectly. If there are no surprises, if you can cost out a program down to the last penny, there's obviously no risk – and probably the project isn't worth doing. That is a reality that's not well understood outside the industry.

GW: *Is there an unwillingness to accept risk?*
Gavin: Well, I think there has to be some motivation – a sense that our competitors are catching up with us. The LM program is an outstanding example of this. The United States wanted to catch up with and surpass the Soviets, and made a tremendous investment in a high-risk program. The program cost a lot more than the original estimate, but it was carried out in spite of setbacks. Today, something as serious as the Command Module fire at the Cape would cancel the program.

GW: *What about space exploration today? What direction do you see it taking?*
Gavin: It's a problem for NASA that we seem sufficiently ahead of the rest of the world – there's less motivation for progress. But if we assume a complacent attitude, the Soviets could pass us. In 10 years, the Europeans could catch up. The Japanese might look more formidable in 20 years because they're making good, conservative, steady progress.

I think the space station will happen, though maybe not as quickly as we'd like. And I'm not at all sure that going to Mars is very important.

GW: *Why not?*
Gavin: I think a much more reasonable argument can be made for putting huge radio telescopes on the back side of the moon. Such telescopes, shielded from the electronic noise generated on earth, could explore the universe more thoroughly. This, I think, is more useful. However, I believe we have concerns on earth that are much more pressing.

GW: *Such as . . . ?*
Gavin: Energy. We are looking at a significant social and economic crisis when we consider that conventional power is becoming more expensive while the growing population can't find jobs. Mexico is the most dramatic example of the urgency of the problem: half their population is under 18! We are going to need a non-fossil source of power within the next 50 to 100 years. The developing countries will need power – they won't be content to be semi-developed. There is a clear need for fusion energy.

> 'If fusion became a national priority the way going to the moon was, it would take about 12 years.'

GW: *What sort of progress is being made in fusion energy?*
Gavin: It's not nearly as good as it could be. If fusion became a national priority the way going to the moon was, it would take about 12 years. In 12 years, you'd either know for sure that it could be done, or you'd know it was impossible. But at the present rate of progress, we're just creeping up on a demonstrator and it's taking a very long time.

The work that Grumman has done on fusion, at Princeton especially, has given us an excellent reputation in the field – and we've added to the talent that exists in the national laboratories. But the fusion budget was cut this year, and that was a real setback.

GW: *Why isn't fusion getting the attention it needs?*
Gavin: Because the energy situation has been mismanaged – lots of people don't believe there was or is a problem. The average individual doesn't look that far ahead. Another example is this: the amount of carbon dioxide in the atmosphere has been increasing since the industrial revolution. But by the time we finally recognize it as a real problem, there will be much more of a problem to solve. We have fumbled for 15 years about the garbage problem, too; we simply have not coped. At some point, it will become a major crisis, and it will be much more difficult to solve than if we'd started 10 years ago.

GW: *Any ideas for a solution?*
Gavin: One place to start is with the budget. It would be enormously beneficial for the U.S. to get on a multi-year budget. We grind up so much energy on our annual budget debate it detracts from the work we must do. The Joint European Torus – which is a fusion device – is set up as a five-year program and revised every three years. In this way, the European Community has provided a level of stability that has greatly benefitted that program.

> 'You know, I've always felt that Grumman is a vastly underrated company – it makes me think of that ad you used to see in the back of magazines: "They laughed when I sat down to play."'

GW: *What direction do you see the company taking?*
Gavin: As we approach the end of 1985, Grumman seems very well positioned. We have our work on the F-14D and the A-6F, Joint STARS, and our new Electronic Systems Division is in place.

You know, I've always felt that Grumman is a vastly underrated company – it makes me think of that ad you used to see in the back of magazines: "They laughed when I sat down to play." In a lot of the competitions we entered, we weren't considered serious contenders – and then we surprised everybody. It's no accident that the F-14 is the premier fighter of the western world; that the Lunar Module completed every one of its missions; that we've dominated the electronic warfare segment of military aircraft. This is a superbly capable company. I suppose that sounds chauvinistic – but that's how I see it.

GW: *About the F-14 – you've always taken a strong stand on its superiority to the lightweight fighter, haven't you . . .*
Gavin: The lightweight fighter concept has been attractive to a lot of people for as long as I can remember. There were efforts to build one during World War II because of the Japanese Zero. But everyone forgets that the F6F – the Hellcat – cleaned the Zeroes out of the sky! Grumman's F11F-1F – the Super Tiger – was a stripped down fighter, comparable to the lightweight fighters of today. We built two of them in 1956. But it just wasn't adequate, and the Navy decided against it in favor of the F-4, a heavier, more versatile machine. In 1975, a series of studies compared the F-14 to the lightweight fighter and offered compelling evidence that the lightweight fighter was not a good investment. With the F-18, the government spent more

and got less. The potential savings of a lightweight fighter are illusory. In my testimony before a Senate subcommittee in '75, I used blunt words about this and never had to retract a single one. I think the respect our F-14 is accorded today bears this out in a silent sort of way.

GW: *What about diversification?*
Gavin: I don't think the commercial segment of our business will ever be as big as we had envisioned in the 70s, when we were aiming for a 50-50 mix. But there are some attractive opportunities, especially in our Data Systems and Electronics Systems divisions, and of course we're hoping for good news on the Postal Vehicle.

It's very difficult to tell what's going to succeed. The Kubvan, for instance, would probably have been a success if the gasoline crisis had continued. But the timing was poor; conditions changed. It's hard to predict that sort of thing.

The diversification represented by our new divisional structure is different. It became clear to us, for instance, that some contracts were going to electronics houses because the military was unwilling to put them into an airplane company. Our new structure matches the organization to the marketplace.

'Modern engineering is so complex that the day of the lone inventor is pretty much gone.'

GW: *What makes a good engineer?*
Gavin: An engineer has to have a fascination with how things work; a desire to achieve superior performance; a talent for problem solving; an indefinable imagination that leads to innovative thinking. I'm not at all sure that those things can be taught. Also, very important, is integrity. Engineering is unforgiving: something either works or it doesn't. Inevitably, one's level of integrity comes out. Ability to work with a team is important, too. Modern engineering is so complex that the day of the lone inventor is pretty much gone. The modern engineer has to be able to get along well with others, coordinate an effort, be part of a team. I think there's still ample opportunity to exhibit ingenuity. In any organization, there is a small nucleus of people who are drivers and leaders; the rest are competent to put it all together. You don't need everyone to have the same gift of innovation and daring.

GW: *You're a native Bostonian, but you've been on Long Island for almost 40 years. You've seen a lot of changes here . . . .*
Gavin: I remember when there were nothing but potato fields on either side of South Oyster Bay Road. There were 12 telephone poles along that stretch – and in '48 or '49, when Grumman people were getting new post-war automobiles, those poles served as markers for checking your acceleration. I look at that stretch of road now, and it's incredible how the wave of housing came east and swallowed us up. In the early days, the real estate salesmen used to come out here on the weekends to sell houses – because on the weekends Grumman wasn't flying airplanes!

The noise of jet aircraft led to the establishment of our Calverton facility. In '53 or so I remember we had a Navy team in Bethpage to fly F9F-6s – Cougars – and they were practicing touch and go's. The noise! Our switchboard lit up like a Christmas tree. That was the last time we did any jet flying in Bethpage.

GW: *Did you ever imagine that you'd stay at Grumman this long?*
Gavin: I suppose that I didn't envision that I'd spend my whole career here – but I come from a generation that thinks in terms of sticking with an organization. Coming from the Depression, the value of a paying job was not to be taken lightly. People today seem much more casual about the risks involved in changing jobs. But there were a lot of opportunities here. Grumman seemed to be in the lead then in its ability to do things swiftly and do them well. I was assigned to Dick Hutton in the preliminary design group, and there were always interesting things to do.

GW: *You have three grown children. Was it difficult – especially while you headed up the LM program – to balance your work and family responsibilities?*
Gavin: Of course – it's a problem for anyone who's very involved in a career. But I am fortunate in having an extraordinarily understanding wife. Dorothy was left on her own much more than was reasonable, and that was quite difficult. There were advantages and disadvantages. I missed out on many activities with our young people, but there were things they learned because of my work, too.

GW: *What about your work now as a consultant?*
Gavin: I'll be here not over 90 days a year. There are a number of areas where I feel I can be of assistance – especially those involving Grumman's relationship with technical societies and the National Research Council. I've just come back from a Space Station review meeting at Rockwell, a senior review group that draws on past experience to ask why things are being done in certain ways.

I'm also on the board of trustees of the Massachusetts Institute of Technology, and I'll be president of that alumni group next year. I'm committed to a great deal of fund-raising work for MIT, which is only fair. MIT was very good to me. I spent five years there as a scholarship student, and it changed my whole life.

GW: *When your consulting arrangement with Grumman ends in four years, do you plan to go back to New England?*
Gavin: No. We'll spend more time up there skiing, but our roots and our friends are here now. Plus, I'll be able to keep an eye on the progress of the Grumman Corporation, which I expect will be impressive. I have always felt that, in those areas in which Grumman chooses to compete, it has the talent and the ability to do the job better than anyone. ■

A Distinguished Career. *In 1950 (above), Joe Gavin (R) and Joe Lippert (seated L) assist chief development engineer Dick Hutton on a preliminary design project. In the background, Howard Weinman works on a mock-up. At left, Joe and his wife Dorothy attend a Grumman rally during the 1981 LTV takeover attempt. Below, Gavin points out details of the Lunar Module mock-up to space scientist Werner Von Braun during a 1964 visit.*

EF-111A Raven: NATO's Modern Suit Of Armor

RAF Upper Heyford, England – "Moscow is only two-and-a-half hours away," says Grumman site manager Jerry Markham, as he glances out the window of the Grumman Field Operations office here.

As far as the eye can see, there are heavily fortified concrete shelters with thick steel doors. On the far side of the runway resides the U.S. Air Force's only squadron of Grumman EF-111A Ravens in Europe – the 42nd Electronic Combat Squadron.

At two o'clock (Greenwich mean time) every afternoon, the Grumman office phones start chirping. New British phones don't ring, they emit an electronic chirp. "That's Long Island calling," says Markham, as he reaches for the receiver. "It's eight in the morning there."

Grumman field reps have been supporting the EF-111A at Upper

'Most field reps are self starters, self managers.'

Heyford since June 1983. Their office is very modern compared to British building standards where a local dwelling can easily be older than the United States.

The double-sized trailer is located inside the base's security gates, off in the corner next to the base dog kennels. Just outside the fence is an anti-nuke camp of vagrants and hobos, who occasionally jump the high barbed wire fences and spray paint graffiti on the trailer. It doesn't seem to bother the Grummanites.

"The people in the camp are really just hippies left over from the last decade," says Markham. "In the summer months, it becomes a camping ground, but when it gets cold there are very few people living there."

Markham is a soft-spoken man who only raises his voice when a supersonic jet roars off the runway a few hundred feet outside his window. "This is certainly a long way from Whidbey Island," says Markham, who used to be Grumman's EA-6B project manager at the naval air station near Puget Sound in Washington.

The Grummanites here are specialists in supporting the Raven with all its sophisticated electronic black boxes. They can troubleshoot a faulty box like an auto mechanic can change oil. It's a Grumman tradition that when you buy a Grumman plane, you get a field rep with it. It's similar to buying a Toyota and the car manufacturer sends along a service rep with the keys.

"Most field reps are self starters, self managers," says Al McLean, who's hobby is electronics. "They know their job and what they have to do. It's an attitude some might take as arrogant. It's a skill. In the beginning, you watch others and try to learn quickly. You don't get too many opportunities to screw up."

On occasion, Grumman reps will hold a meeting with the Air Force maintenance crews to discuss the latest modifications to the EF-111A equipment. But most of the contact is right on the flight line, in the supply depots, and in the hangars. To the Air Force crews, the field rep is "Grumman."

Where the EF-111As go in Europe, so go the Grumman reps. In May, during Exercise Distant Hammer, Rick Slemmer travelled to Gioia Del Colle, Italy, with the EF-111A squadron. "I was out in rain helping a guy replace a box on the plane, and an officer came up to me and said, 'You don't have to do that,'" says Slemmer, who served in the Marine Corps and had carrier duty as a rep. "It's my job to help keep the planes flying."

'The EF-111 certainly is a welcome addition to both USAFE and NATO.'

Even with frequent trips to the flight line, the Grumman field reps don't get tan. Thick as pea soup fog and misty days are the norm here.

It does give the base's surrounding countryside a lush green tinge. The pastures are lined with hedgerows and populated with sheep. An occasional bright yellow field of rape seed breaks up the green landscape.

Across the street from the Grumman trailer is an EF-111A supply depot, half buried in the British earth. The building, equipped with a chemical warfare ventilation system, is covered with camouflage netting. War exercises – when the entire base is on alert – are as common here as grade school fire drills.

Although based in Britain, the EF-111A squadron is part of the 17th Air Force which is responsible for the USAFE (U.S. Air Forces in Europe) activities in West Germany and the Netherlands. The Ravens are currently the only tactical jamming system within NATO (North Atlantic Treaty Organization) forces.

Since its European debut in February 1984, the EF-111A has added a new dimension to NATO's electronic combat forces. "It's been a success from the day it rolled in here," says Col. Dale Thompson, 20th Tactical Fighter Wing commander at RAF Upper Heyford.

"As a one of a kind here in Europe as far as Air Force assets go, the EF-111 certainly is a welcome addition to both USAFE and NATO," says Thompson. "From the beginning, we've been exercising with NATO forces throughout Europe."

To date, the 42nd has participated in over 30 NATO and multinational missions. The Raven is in

Jamming In Europe. *The U.S. Air Force's only RAF Upper Heyford, a few miles north of Oxford, tactical jamming system within NATO forces.*

such demand because Europe is a hotbed when it comes to electronic countermeasures.

For the past two decades, the Warsaw Pact has been adding one new electronic air defense system a year in Europe. As a result, the Soviets have built the world's densest electronic blanket along the Warsaw Pact's western border.

Today, there are more than 2,000 radar beams eyeing NATO forces. Entering and jamming the Soviet's multilayered air defenses would be one of NATO's first orders of business in a confrontation. It has to be. NATO forces are far outnumbered.

In a European confrontation, the Grumman EF-111A is expected to bear the brunt of the airborne jamming role. The EF-111A's wartime mission

'We just don't yank and bank to the target. We have to fly smart.'

is to disrupt or blind the Warsaw Pact radar defense net. In essence, the EF-111A's job is to shield NATO's attack aircraft by jamming the enemy's radar.

Packed with the latest in electronic wizardry, the EF-111A can cloak the NATO's attack forces with a protective electronic smokescreen. With the flip of a few switches on this airborne jamming system, the enemy's radar screens can go bonkers. A single blurred cluster of blips suddenly bursts into a scattered dozen . . . then hundreds, even thousands. Radar scopes get cluttered with ghostly interference patterns. Dense rainstorms mysteriously appear on the scopes.

Because the Raven is a new weapon system in Europe, NATO commanders are still learning how to employ the EF-111A effectively. "At major USAFE conferences, there are more EF-111A crews invited to speak

dron of Grumman EF-111As in Europe resides at ;land. The Ravens are currently the only active

than any other aircraft crew," says Thompson.

Even though the 17th Air Force is headquartered at Sembach Air Base in West Germany, the sole squadron of EF-111As remains at Upper Heyford. That way it can share maintenance and support facilities with the 20th Tactical Fighter Wing, which operates F-111E aircraft.

"Seventy percent of the parts are common to both the F-111 and EF-111," says Col. Pat Barry, 20th Maintenance Commander. About 150 Air Force personnel are strictly dedicated to maintaining the EF-111 at Upper Heyford. "Of course, that number will grow as the number of EF-111s increases," adds the colonel.

At present, there are nine Ravens attached to the 42nd. By the end of this year, there will be 13. "So far, the EF-111A's availability and reliability are excellent," says Barry. "Very seldom do we have to abort a flight. Usually, we can start flying them three days after they arrive from Grumman."

"We fly regularly in England and West Germany and we've also participated in missions to Spain," says Lt. Col. William McAdams, 42nd squadron commander. "I've also been to a number of battle planning conferences and have heard nothing but good feedback from NATO staff officers and commanders about the plane's contribution to their missions."

Success doesn't come easily. "It takes a great deal of pre-mission planning. We just don't yank and bank to the target. We have to fly smart," says McAdams.

EF-111A crews have to know the enemy, but they have to know their NATO partners, too. "Because we usually fly with a composite force of different aircraft from several nations," adds the colonel, "we have to know their capabilities, too."

Although NATO is a composite force, electronic warfare responsibilities rest squarely on the EF-111A. To provide its electronic protection to NATO tactical forces, the Raven has three primary missions: stand-off jamming, close-in jamming and penetration.

'We don't need much imagination to stay mentally ready for war.'

The 42nd's crew relies heavily on support provided by their 11-member intelligence section. "Right from the planning stages, they are an integral part of our mission," says McAdams. "They help keep the crews abreast and one step ahead of the enemy should we ever have to go to war."

The intelligence community provides the basic threat analysis that other squadrons get such as where the SAMs or anti-aircraft artillery might be. "We also sift through mounds of data to provide the EWO an analysis of the Warsaw Pact's radar capability," says Lt. Col. James Aubrey, the squadron's senior intelligence officer. "This helps him figure out the smartest way to counter the threat in the target area.

"Because we are a short flight away from hostile territory, we don't need much imagination to stay mentally ready for war," adds the major. "We'd be in the middle of it. We're ready." ■

On Holiday. *Earlier this year, Grummanites stationed at RAF Upper Heyford, England, travelled to Paris en masse. Above are (L to R) Al Green, Joyce Harns, Pauline and Barney Minogue. The Minogues have since returned to the States.*

From A to Zed, Americans Love Britain

"There are enough cracks in this old house to let generations of field mice come and go freely," says Grummanite Jerry Markham as he steps back to let a cat scurry past. The British tabby, named after Prince Charles' and Princess Di's first son, gets good traction on the wide plank floors. "William is a crazy cat, but he's a good mouser."

Markham and his wife Shingi live in an old stone-walled dwelling called The Unicorn House in Bloxham. It used to be the village tavern, but that was a century ago. Today, it is the Markham's home away from home and is filled with antiques – some from the States, some from the surrounding countryside.

He heads up Grumman's field office supporting the EF-111A at RAF Upper Heyford, England. The other Grumman Field reps also live in homes that are older than the White House. Al McLean lives near Britain's oldest university in an Oxford suburb of Summertown. Rick and Cynthia Slemmer and Steve Ingalls live in nearby Kidlington, where on a Sunday afternoon you can watch Prince Charles playing polo.

"You get a new perpective of how the world views the United States when you live overseas," says McLean. "All you have to do is watch the news on TV and see how the BBC reports what's happening back home."

The Grummanites observe that Britain's class structure is rigid. "The British find their niche in life and they are satisfied with it," says McLean. "If you are born into a working class family, you will remain at that social level. If your family is on the dole, you accept that you will be on the dole, too. By contrast in America, if you are not satisfied with your lot in life, you have the opportunity to change. Americans are more aggressive and opportunistic. The average Joe thinks he's just as good as a Rockefeller."

Ingalls admits that being single can be lonely at times, but an old Navy buddy recently moved to Northampton about 50 miles away and Ingalls sees him often. He also spends his free time studying electrical engineering through the University of Maryland overseas program. One British math professor did pose some challenges. "It took me a while to get used to 'nil' for zero and 'zed' for z," says Ingalls, "but you catch on."

Slemmer loved renting the "Town End House," which featured a glass gardener's shed, and an old carriage house. It was in the little village of Islip, and an easy walk to the local watering hole, The Red Lion Inn. Behind the pub, he and his neighbors played Aunt Sally, a game where you throw sticks to knock pieces of wood off a post.

"Last July 4th, I threw an American barbeque for the village . . . . I got hot dogs, hamburgers and American beer at the commissary,"

(Continued on page 8)

Fun At The Red Lion. *Behind the Red Lion Inn in Islip, England, Grummanite Rick Slemmer tries his hand at the game of Aunt Sally. You have to knock off the blocks of wood on the post.*

Yanks Overseas. *On their holiday jaunt to Paris earlier this year are (L to R) John Yukish, Everett and Joyce Harns, Lee Yukish, Pauline and Barney Minogue, Jerry and Shingi Markham, Cynthia Slemmer, Al Green and Rick Slemmer. Above, Markham and Steve Ingalls stroll down the village of Islip. At right is Yukish who recently returned to the States.*

Yanks Having A Jolly Good Time

(Continued from page 7)

says Slemmer. "It ended up that the village was also having an affair to raise money for the local school, so we combined the two. Everybody really enjoyed it."

When his lease was up, the townspeople tried to find another place for their Yankee friend to rent. Unfortunately, Islip was booked and he had to move on to Kidlington. He still returns to the Red Lion Inn for some brew with his friends.

Travel is a big part of all the Grummanites' lives. You can easily hop on a train and ferry and be in Paris or Amsterdam for the weekend. "Living so close to the Continent you can get real good buys on airline fares, too," says Markham.

"You can tell when there's a holiday coming up," says secretary Laurie Thompson , whose husband is stationed at the base. "The maps and travel guides come out."

During his overseas stay, McLean is determined to learn how to ski. "I don't recommend getting up on skis for the first time in the Swiss Alps," he says, reflecting on his maiden trip down the mountainside last winter.

While the others prefer flying to their destinations, Everett Harns is the group's resident Charles Kuralt. He tours the European countryside in his newly purchased motorhome.

On weekends, Markham and his wife Shingi tour the British countryside looking for antiques. The strong American dollar has made Royal Doulton figurines, china, and wool very reasonable. For her friends back in the States, Shingi has served as the European connection for cashmere sweaters and Cabbage Patch dolls when they were hard to get in the States.

Shopping in Britain offers the Yanks a new experience in bartering. "It's basically a free market here. The price is whatever the market will bear," says McLean. "However, in the U.S. you can't pick up a Sears drill with a price tag of $45 and say to the sales clerk, 'I'll buy it for $35.' He'd look at you like you're crazy. In Britain, after a little haggling in local shops, you can usually get an item at the real market value."

The biggest adjustment that the Grummanites faced was driving on the left side of the road. "When you first come over here, you have to keep thinking 'left,'" says Ingalls. "In the beginning, I took my share of curbs."

Markham says it's tougher adjusting to the right side of the road when he returns for occasional trips back to Long Island. "Because there is no speed limit in England, I drive too fast when I come back home, and I find myself moving over to the left."

We'll keep you posted on Markham's next trip to Melville.

What Do You Think?

President Reagan's proposals to reform the federal income tax system are currently stirring debate in Washington. Among the more controversial parts of his plan: a proposal to cap or eliminate altogether deductions for state income taxes and local property taxes. *Grumman World* asked Grummanites in Bethpage's Plant 1 for their opinions on the proposals. What do *you* think?

Dotty Wirtz

Eliminating some of the deductions would harm me personally because we're just in that bracket where you can put everything down. But in the long run, it'll be much simpler for everybody. I don't really have many medical deductions anyhow, because I belong to the HIP [Health Insurance Plan, a health maintenance organization].

I probably will come out paying more tax – but then, I won't have to go to an accountant and pay someone to do my tax return every year. My husband and I will be able to do it ourselves. The tax should be an even percentage – whether you make $20,000 or $100,000. That way, it's simpler for everybody.

Enid McEvoy

Well, I don't like the idea of losing a tax shelter for owning a home. Maybe it's because I'm a homeowner, but it seems to me that it would kill any incentive for anyone to buy a home. Let's just say a whole upcoming generation didn't buy homes – they would rent. And wouldn't all of that skyrocket? I like the idea of getting a tax break because I'm a property owner.

I've heard that certain tax loopholes for big businesses would be phased out, and I think that's good. But of course, I don't own a business – I don't know how I would feel if I did!

There have also been some proposals of a blanket tax percentage across-the-board. I happen to think that's a good idea. If everyone were taxed 10 percent, or whatever percentage they came up with, you wouldn't have all the paperwork and all the energy people devote to trying to find out legal loopholes.

Carry Naepflein

The new tax plan is basically set up to bring in additional revenues. Generally I'm in favor of the plan because the government has to get that additional revenue. The alternative is to increase taxes, which I don't think the public favors.

So we have to look for ways to close loopholes, because of deficits but also because of additional spending in foreign aid and so on. It might not be favorable to everybody. To take the deduction away for the homeowners, that's going to hurt.

There are certain parts of the tax plan that I personally don't like. But if it has to be, we should think in terms of our society, and not always about ourselves. There are other ways to save money, which are politically not favorable because of the things the government promises and has to do, which cost money. What I especially don't approve of is that we have increased our foreign aid so much at the same time that we've had such a trade deficit and have lowered import restrictions.

Frank Lana

There will be fewer deductions, apparently, which means less money for the taxpayer. First of all, everybody should pay taxes. Right now, some people don't. The government is trying to balance the budget, and when it does, everyone's going to have to share the burden. No two ways about it.

If the federal government wants to balance the budget, it will. The Reagan administration has been very successful in getting its programs passed. In the future, if the budget is balanced, less tax will be taken out of your salary because they won't need as much money. In the long run, we'll become more of a pure capitalistic society.

Steve Mosca

It comes down to two things. The federal government is either going to raise taxes, or cut spending. They've got to get the money from somewhere. If they want to cut down the welfare programs, and make domestic cuts and Federal cuts, that's fine. If they want to eliminate deductions for the middle class, they'll be putting us deeper in the hole. And that shouldn't be allowed. But some kind of reform is needed. The plan doesn't stand a chance of passing as it's presently written. I really don't think the federal government is going to balance the budget – I think it's a lot of political rhetoric.

Abraham Fernando

Basically, it's a step in the right direction. It's not a cure-all, but it's the beginning. As far as the middle income group is concerned, it's always been the case where we've paid most of the balance and it's going to continue to be that way, no matter what they say.

One way or another, they're going to take from us from the left hand and put it in the right hand, and it's going to come out not much different. The one idea I do believe in is the 10 percent flat tax. It's about time. Ten percent will make those who have not paid anything at least pay something. If you're in the 33 to 40 percent bracket, and you're down to 10 percent, then even if they do charge you for some of the things that you now take advantage of, you're still going to come out ahead. ■

Uncovering A Story. *Welder Richie Alois (L) and welding engineer Frank Pelkowski set up a job in the aptly named 'clamshell' electron beam welding vacuum chamber (photo L). It's used to weld long, narrow parts such as F-14 titanium wing skins. (Photo below) Welder Jim Sheeran bolts a titanium plate onto an MX missile shroud section fixture. Grumman uses EB welding to produce the three main sections of the shroud for Avco Systems. (Photos by Bob Settles)*

In Electron Beam Weld Arena, Grumman's A Heavyweight

The equipment to handle big jobs and 16 years of experience in electron beam welding is a one-two punch that sells.

Not only does Grumman's electron beam (EB) shop in Bethpage play a critical role in F-14 production, the Plant 2 shop has also attracted others in the aerospace industry. At present, Grumman is doing about $10 million in EB welding subcontract work.

This lucrative subcontract work is taking up a increasingly larger chunk of Grumman's EB weld work schedule. "Grumman work and subcontract work is now split about half and half," says Tom McGrath, the president of the Aerostructures Division.

It's not that Grumman has a lock on the technology. "Most of the aerospace companies and all of the engine manufacturers can do electron beam welding," says McGrath. "But nobody has the capacity that Grumman does."

The image most people have of welding doesn't apply to EB welding. It's not a guy wearing an armor-like mask and standing over a chunk of metal while sparks fly all around an eye-searing white fireball.

EB welding takes place inside a huge vacuum chamber. The parts to be welded are clamped to a frame and rolled into the chamber. The huge door is then locked shut, and the air is pumped out of the chamber.

A blue, hair-thin electron beam is generated by 60,000 volts of electricity. The beam follows the seam of the two parts and heats the metal to 4,000 degrees Fahrenheit. The edges of the two parts melt and mix – in effect making two parts into one.

Grumman has five electron beam chambers. Four resemble garages with massive, reinforced walls and sliding doors to keep the chamber from being crushed by the outside air pressure. The fifth chamber looks like a low, long quonset hut.

The company recently spent over $2 million to modernize its No. 1 chamber, which is considered to be the largest in the free world. It was the size of Grumman's welding chambers that brought Avco to Grumman.

The EB shop produces the Peacekeeper (MX) missile shroud for the Avco Systems division of Textron. The shroud is the nose cone which covers the reentry vehicles on the missile during the boost phases.

As a subcontractor to Avco, Grumman developed all the tooling, welding and assembly techniques necessary for the shroud. It's a job that's been worth more than $20 million to Grumman thus far.

"The Peacekeeper shroud program requires extremely precise and strong welds throughout its construction," McGrath states. "Grumman is one of the few companies that have the facilities and experience to handle a job like this."

"The current contract runs through 1988," says Aerostructures program manager Tom Gillen. "But we expect to be involved in the program as long as Congress keeps allocating funds for the Peacekeeper missile."

General Electric has also been tapping Grumman's expertise in large electron beam welding jobs. Grumman welds the fan blades for GE's turbofan CF6-80C2 engine, which powers the Aerobus Industrie A310-300 airliner.

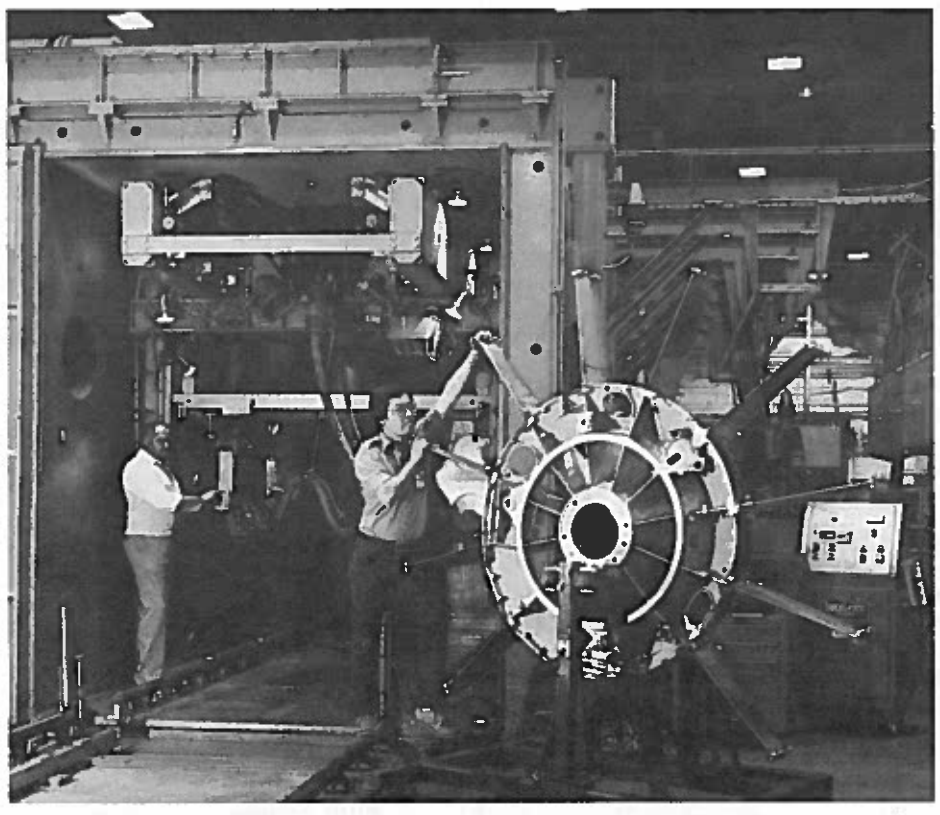
The EB weld shop has already finished 60 fan frames – a job worth about $1.5 million – and is under contract to do 66 more.

Twelve, 36-inch fan blade sections are welded on each fan frame. The blades are hollow, which means the beam must weld the front and back of each blade at the same time. "No one had tried such a thing before," says Joe Newman, Process Engineering section head. "When we proposed our solution to GE, they said it couldn't be done. They felt no one could weld two surfaces at once. The first test unit we did came out perfect."

Development work and production started in 1983. "We delivered the first unit a month ahead of schedule," says Newman. "GE was so happy with our work that they threw us a party."

By far, the longest running program at the EB weld shop is the F-14. Grumman set up the shop just for this job back in 1969. Process engineer Dietrich Helms, who's been with EB Weld since then, points proudly to the center section of the F-14, a massive titanium box that is "the backbone of the F-14." The sweeping wings of the Tomcat are attached to the ends of the box, which doubles as a fuel tank.

Aerostructures has successfully built on Grumman's experience with such complex EB welding jobs. With the imminent signing of a contract with Martin-Marietta to build shrouds for the small intercontinental ballistic missile, the division will have even more EB weld marketing punch. ■



Fan-tastic. *Roger Ng (R) looks like he's at the helm of a ship. But he's actually showing what a fan frame for a GE turbofan engine looks like after Grumman's EB Weld shop finishes welding the blades to the frame. Horace Holloman (L) manipulates the electron beam gun mounted inside the vacuum chamber.*

Service Milestones

40

Katherine Bergeman, Prod. Plt. Mgmt. (2)
Richard A. Boddy, Plastic/Plaster Tooling (110)
Bertram R. Bedell, ILS Prod. (15)
Victor R. Milligan, Elect. Wire Prep. (44)

35

Antoinette Wagenknecht, Prod. Plt. Mgmt. (1)
Gordon E. Baylis, Tool Cont. (2)
Gordon M. Campbell, Resources (5)
Harry Bowie, Trans. (7)
David Collins, Trans. Ops. (2)
Robert G. Rouse Jr., Property Mgmt. (30)
Earl W. Albright, Equip. Des. Eng. (30)
Henrietta A. Keveney, Mass. Prop. Anal. & Cont. (40)

30

Charles C. Clanton, I.E. Flow Seq. Prod. (1)
Anthony J. Parrella, Ctr. Sect.-Sub-assembly (2)
Joseph M. Amodeo, Welding (2)
Vincent G. Stano, Detail Parts Fab. (3)
William A. Winslow, Flt. Ops. (4)
Arthur H. Huber, ILS Ops. Supt. (4)
David B. Seeman, Flt. Crews (4)
George E. Kaese, Subassembly-Maj. (5)
James A. Green, Maint. (5)
Raymond P. Seibert, Mech. Insp. (5)
Raymond F. Shea, F-14 Comp. Instal. (6)
John E. Candon, Engines (6)
George Rottner, Struct. Subs. (6)
Edward G. Clark, Assy. Methods & Plann. (6)
Thomas Smith, Final Assembly. Insp. (6)
Warren A. Unneberg, Plan. & Cont. (6)
Joseph W. Goodwin, Prod. Deputy Statn. (7)
Henry Steier Jr., Plt. Mat'l. Stor. & Distr. (8)
Raymond Bromm, Maint. (12)
Charles W. Patterson, Elect. Test (14)
Thomas E. O'Brien, PPM E-2/C-2A (25)
Richard J. Basak, Crew Supt./Equip Integ. (25)
James B. Scanlon, Prog. Mgmt. E-2 (25)
William E. Smiddy, Facil. Eng. Mgmt. (30)
Peter R. Walters, Gen. Acct. (30)
Bertel Seberg, Pwr. Plt. & Env. Staff (35)
Richard G. Anderson, Eng. Mgmt. (35)
Pierce J. McCarthy, GSE Sch. (43)
Clifford C. Fenwick, Tech. Ops. (77)
John F. Carr, Vice Chairman of the Board (D.C.)
Jean T. Beacorn, GDS Acct/Fin. (GHQ)

25

Ronald J. Bransfield, F-14 Prog. Mgmt. (1)
Norman E. Wright, Maint. (3)
Robert A. Tumilowicz, Aircraft Prog. (4)
William S. Zebroski Jr., Flt. Avion. (7)
Kenneth A. Kneski, Elect. Fab. (7)
John A. Grosser, ILS Elect. Pkg. (7)
John L. White, Instruct./Anal. (8)
Fritz E. Meyer, ILS Prod. (15)
Jean E. Zach, ILS Secty. Serv. (25)
Frederick G. Danner, ILS Equip Des. Engrg. (25)
Anthony G. Zimbalatti, Sys. Dev. & Integ. Mgmt. (35)
Frank H. Trimble, Tech. Ops. (77)
Philip E. Morris, ILS Equip Des. Engr. (110)

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R. J. Bransfield

N. E. Wright

R. A. Tumilowicz

W. S. Zebroski Jr.

K. A. Kneski

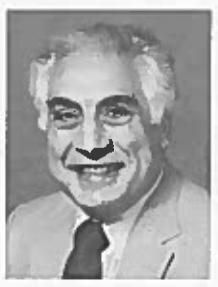
J. A. Grosser

J. L. White

F. E. Meyer

J. E. Zach

F. G. Danner


A. G. Zimbalatti

P. E. Morris

What A Ruler!

Of immeasurable value to Grumman's quality assurance programs is this new Mauser Coordinate Measuring Machine, being operated by quality engineers Steve Korosh (R) and Glenn Barth.

"If not the largest, it's the second largest in the country," says Korosh. It measures the contours and dimensions of tooling, machine parts and engineering models as big as 5x2x2 meters. This programmable, computer-numerical-controlled offspring of the ruler measures with a repeatable accuracy of 1.2 ten-thousandths of an inch.

To keep it rock steady, parts of the machine are mounted on granite. It was installed last month in the new section of Plant 3 in Bethpage. (Photo by Ken Johnson)

Retiree Obituaries

Clark C. Paye of 237 Oak La., Forked River, New Jersey, died Sept. 5, 1985. He retired in 1963.
Alphonso Carretta of 8379 Boca Glades Blvd, Boca Raton, Florida, died Sept. 21, 1985. He retired in 1973.
William Yunger of 17 Dairyfarm Rd., Stony Brook, N.Y., died Sept. 26,1985. He retired in 1977.
Elton A. Small of 50 Jefferson Ave., Roosevelt, N.Y., died Sept 29,1985. He retired in 1978.
M. A. VanEssendelft at Box 157A, Rt. 2, Belhaven, North Carolina, died Oct. 3,1985. He retired in 1977.
John Wahlen of 44 Harding Ave, Hicksville, N.Y., died Oct. 3,1985. He retired in 1963.
William L. Skinner of 60 Litchfield Ave., Babylon, N.Y., died Oct. 6,1985. He retired in 1973.
Albert C. Smith of 67 Claire Ct., West Babylon, N.Y., died Oct. 10,1985. He retired in 1965.
William R. Hall of 64 Vondran St., Huntington Station, N.Y., died Oct. 11,1985. He retired in 1984.
John J. Palazzo of 20 Eva Pass, Commack, N.Y., died July 15,1985. He retired in 1964.
George H. Nussberger of 3107 Heritage Rd., Milledgeville, Georgia, died August 9, 1985. He retired in 1983.
Anthony D. Scibelli of 113 Lake Ann Dr., W. Palm Beach, Florida, died Oct. 8,1985. He retired in 1971.
John J. Sellars Jr. of 868 Duncan Dr., Westbury, N.Y., died Oct. 11, 1985. He retired in 1977.
Frank J. Beagan Jr. of 48 Linden Pl., Roosevelt, N.Y., died Oct. 11, 1985. He retired in 1977.
Edward H. Townsend of 4771 78th Ave., Pinellas Park, Florida, died Oct. 12, 1985. He retired in 1980.
Seaton H. Stenard of Kripplebush Rd., Stoneridge, N.Y., died Oct. 12, 1985. He retired in 1976.
George Vaiana of 2010 Freeman Ave., East Meadow, N.Y., died Oct. 12, 1985. He retired in 1985.
John A. Walsh of 12 Chicago Ave., Bellmore, N.Y., died Oct. 14, 1985. He retired in 1968.
Matthew V. Eannone of 19 Carldon Rd., Commack, N.Y., died Oct. 18, 1985. He retired in 1971.
John F. Burkland at P.O. Box 403, Titusville, Florida, died Oct. 18, 1985. He retired in 1976.
Walter J. Dunne of 37-27 86th St., Jackson Hgts., N.Y., died Oct. 21, 1985. He retired in 1984.
Sydney B. Martin at P.O. Box 83, Bethpage, N.Y., died Oct. 23, 1985. He retired in 1981.
Stanley Michalski of 21 Belver Dr., Bohemia, N.Y., died Oct. 30.

Note To Retirees

Many Grumman retirees are wondering where their issues of *Plane News* are. When the company was restructured, *Plane News* became a monthly supplement for active Grummanites in the following divisions: Aircraft Systems, Electronics Systems, and Aerostructures.

Grumman World is now published twice a month for all Grummanites. Active employees receive the paper at work, while retirees get theirs in the mail. If a fellow retiree is not receiving *Grumman World*, have him or her write to: *Grumman World*, Grumman Corporation, A22-GHQ, Bethpage, N.Y. 11714. We'll put them on the mailing list.

If you are interested in receiving information about trips, hobby shows, or any Grumman activities available to retirees, contact Ellen Drasser in Grumman Recreation, and ask to be put on the Retiree Club Newsletter mailing list. Write to: Grumman Recreation, A01-28A, Grumman Corporation, Bethpage, N.Y. 11714.

Let Us Know

We don't want to do all the talking.

We'd like to know what you think about the things you see in these pages, and what you see going on in the company.

Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A22-GHQ, Bethpage, N.Y. 11714, and should include your name and address. Letters may be edited for clarity or space.

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A Stunning Survey. *Largemouth bass in Calverton's McKay Pond find the annual fish count an electrifying experience. New York State Department of Conservation biologists Charles Guthrie (L) and Bruce Cronemeyer use a system called electro-fishing in which a harmless mild electric charge stuns the bass. The fish are then netted and measured for size and weight. Some are removed to stock other fishing holes on Long Island.*

Big Mouth Bass Hooked On Calverton Haven

It's almost angler's heaven. There are over 3,500 largemouth bass swimming contentedly in McKay Pond at Calverton Operations on Long Island.

Only sport fishing is permitted at this well-stocked pond located directly in front of Plant 6. Lunchtime fishermen must use barbless hooks and return their catch to the water.

The lack of human predators and the abundance of sunfish – a favorite meal of bass – makes McKay Pond a very comfortable and productive home for the fish.

"We keep a close eye on the ecology of the pond, and everything in it," says Barry Andres, assistant manager, Environment & Grounds, Facilities Maintenance for Corporate Services. Calverton pumps up to 36 million gallons of water per month into the pond from its air conditioning system and sewage and industrial waste treatment plants.

"The pond's continued health and large fish population are testimony to the efficiency of Calverton's waste water treatment system," he says.

Because the pond is located inside Grumman gates, security does not permit public fishing. By also restricting Grumman anglers, the bass population can be studied under controlled conditions.

"We prefer no fishing at all at McKay in the interests of protecting the pond's ecology and that of the surrounding shoreline," says Andres.

The pond and the fish it contains are carefully monitored by the New York State Department of Environmental Conservation (DEC). Every fall, the DEC runs a survey of the population and size of the bass and sunfish. The agency uses any surplus bass population to stock public fishing holes on Long Island.

During the survey, DEC biologists and technicians remove a portion of the bass population to take measurements of size and weight. Some of the fish are retained for closer laboratory inspection.

DEC uses a system known as "electro-fishing" to gather their specimens. "We fire a charge of direct current voltage into the water," explains Charles Guthrie, DEC senior aquatic biologist.

"The charge only stuns the fish so that we can scoop them up in nets, take our measurement, and then return them to the water."

The electro-fishing is done mostly in the evening when the bass head into the shallows to feed. "The charge works best in shallow water," says Guthrie. "It's easier to see the fish there, and easier to walk around too."

Because of the unusual size of the bass population in the pond, for the past five years the DEC has removed up to 25 percent of the fish annually. This year, more than 600 bass were removed to stock Hempstead Reservoir on Long Island.

"McKay Pond is very unusual," says Guthrie. "The pond is heavily populated with bass, and all the bass are almost the same size – a little more than 10 inches long this year."

Guthrie says the reason for the standard sizing is the food supply – primarily sunfish. "There are enough small sunfish to keep the bass healthy," says Guthrie, "but not enough medium size meals for them to grow larger."

In this year's survey, Guthrie says they caught a few bass considerably larger than 10-inches. "These bass grew large enough to eat the smaller bass and continued to grow while the general population has reached a status quo."

By thinning the population of bass, Guthrie says some sunfish will have a chance to grow. "Bigger sunfish means bigger food items, and bigger food items mean bigger bass."

And bigger bass means bigger stories from the Calverton fishermen. ■

Looking For Astronauts

Ever dream of becoming an astronaut? Well, the National Aeronautics and Space Administration (NASA) is now taking applications.

NASA needs both pilot and mission-specialist astronauts for the Space Shuttle program. Pilot astronauts serve as either Shuttle commanders or pilots. The commander is responsible for the vehicle, crew, mission success, and flight safety.

The pilot assists the commander in controlling and operating the Shuttle. He or she may also assist in deploying and retrieving satellites using the remote manipulator system (RMS), in extravehicular activity, and in other payload operations.

Mission specialist astronauts coordinate crew activity planning, consumables usage, and experiment and payload operations. They must have a detailed knowledge of shuttle systems, operational characteristics, mission requirements and objectives, and support equipment. They may also perform EVA or payload handling using the RMS.

The basic qualifications for both types of astronauts are a bachelor's degree in engineering, biological science, physical science, or math from an accredited institution. The pilot-astronaut must also have 1,000 hours in-command time in jet aircraft, and pass a NASA Class I space physical. This is similar to a military or civilian Class I flight physical.

The mission specialist-astronaut must have three years of professional experience and pass a NASA Class II flight physical, again similar to its military/civilian equivalent.

Further information or application materials may be obtained from NASA, Johnson Space Center, Astronut Selection Office, ATTN: ATX, Houston, Texas 77058. ■

New Assignment

Robert Pirrung has been named director of Business/Administrative Operations for the Space Systems Division.

In his new post, Pirrung will be responsible for all Business Operations, Procurement, and administrative functions and will report to Alex Alexandrovich, president of the Space Systems Division.

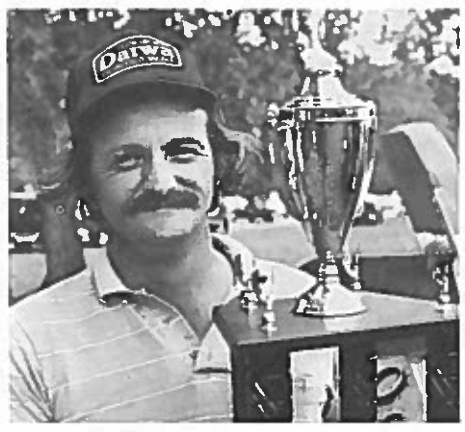
Grummanite Reels In A Fortune

ARKADELPHIA, Arkansas – David Ashcraft, a welder for Grumman Boats here, recently fished his way to a big victory in a local contest.

Ashcraft placed first in the Mr. Bass of Arkansas fishing tournament by reeling in a total of 31.09 pounds of fish from the Arkansas River. In addition to a trophy, the victory earned Ashcraft $15,000 in prizes.

The two-day contest was held on a recent weekend at Little Rock's Murray Park. Ashcraft caught his biggest fish on the second day, a bass weighing 4½ pounds.

An avid fisherman, Ashcraft has had a winning streak lately. Two weeks prior to his first place win, he placed second in the Lake DeGray, Ark., Super Saturday contest. And the day after that, he again placed second in a Muscular Dystrophy Tournament. ■



David Ashcraft

GrummanWorld
November 22, 1985

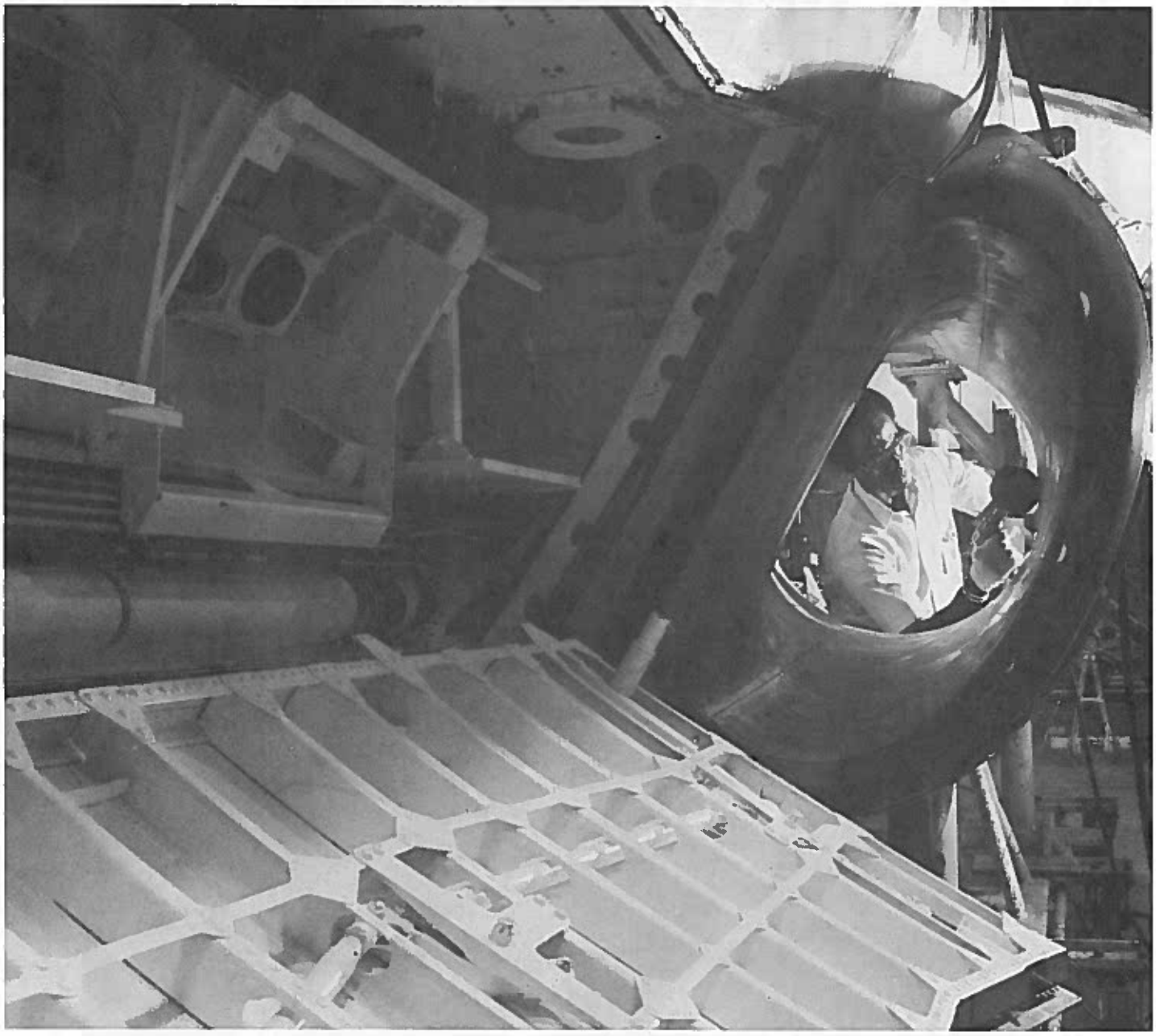


Photo by Bob Serles

Prowler: A Well-Polished Performer

In Bethpage's Plant 2, Rudy Reid polishes the air inlet of an EA-6B Prowler. Grumman delivered six of the tactical jamming aircraft to the Navy during fiscal year '85, which ended in September.

Today's ICAP (Increased Capability) II Prowler is the fourth version of the aircraft. It boasts the latest advances in fully-integrated airborne jamming technology, and is fitted with the Navy's standard AYK-14 computer.

In a related story, the Marines recently brought in the first of 50 EA-6B ICAP I Prowlers for update to the ICAP II configuration. Grumman will also perform Standard Depot Level Maintenance. Story on page 2.

Letters

Dear Grumman World:

I see that 16 new officers have just been appointed – for a total of about 80 new presidents, vice presidents, directors and deputy directors since the reorganization. The reorganization was supposed to eliminate unnecessary layers of management – but we seem to be adding layers instead. How is this going to make the company more efficient?

Furthermore, no one has ever told me what division I'm in. I work in Plant 3 in Bethpage, in Department 840. We make spare parts for military planes, which could mean I'm in Aircraft Systems – but we make commercial spares, too – which would put me in Aerostructures.

Please advise.

John A. Glaser
Bethpage

To answer the first part of your question: the basic thrust of our restructuring is to make us more attractive to our markets. For example, subcontract work is being handled by our Aerostructures group, airplane overhaul and modification is being done by our St. Augustine division – and customers have the reassurance that they are not competing with our larger programs for the attention they need.

New divisions provide new opportunities for people. Initially, at least, that means more titles – though not necessarily more people or more layers. Most of those given new titles are doing essentially the same work – and titles can be quite useful for those who deal with our customers. It gives people a chance to show what they can do – and it makes them more visible, so that their performance can be assessed. Future growth for each division will depend on the ability to bring in new work.

We have already been through a layoff to trim down some areas.

As to divisional assignments: there won't be any "official" reassignments until January 1, 1986. Working out the details of the reorganization is a huge, complicated job with a number of difficult cost accounting issues to be resolved. A new timeclock number system will be in place in the beginning of the year. Most of our people will be in Aircraft Systems, since this is by far the largest division.

Those who are assigned to divisions that were created out of Grumman Aerospace will, of course, retain their same benefits. Those divisions are: Aircraft Systems, Aerostructures, Electronics Systems, Services, Space Systems, and Melbourne Systems. The exception to that would be for those relocating off Long Island, where there may be different benefits appropriate to those areas.

Bob Bradshaw
Vice president,
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